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## OBVIOUSNESS AND THE DOCTRINE OF EQUIVALENTS IN PATENT LAW: STRIVING FOR OBJECTIVE CRITERIA

The United States Constitution grants Congress the power to promote technological innovation by granting to inventors the exclusive right to their discoveries in the form of patents.<sup>1</sup> Congress has delegated the duty of granting patents to the Commissioner of the Patent and Trademark Office.<sup>2</sup> The exclusionary right a patent provides<sup>3</sup> is effected through a civil action alleging infringement of the patent and seeking injunctive relief, damages, or both.<sup>4</sup>

Patent law can be divided into two general procedural periods—the first relating to the procedure of procuring a patent from the Patent and Trademark Office, and the second relating to the enforcement of the inventor's right to exclude others from exploiting the patented invention.<sup>5</sup> In the first period, the invention is fully described in an application containing a disclosure,<sup>6</sup> followed by claims designed to outline precisely

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1. Article I, Section 8, Clause 8 of the United States Constitution grants Congress the power to "promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries." U.S. CONST. art. I, § 8, cl. 8.

2. 35 U.S.C. § 6(a) (1988) ("The Commissioner . . . shall superintend or perform all duties required by law respecting the granting and issuing of patents . . .").

3. Upon receiving the grant of a patent, the inventor has the right to exclude others from "making, using, or selling the invention throughout the United States" for a 17-year term. *Id.* § 154.

4. *Id.* §§ 281, 283-284. Injunctive relief is available to prevent infringement of the exclusive right secured by the patent. *Id.* § 283. Monetary damages are authorized upon a finding of infringement in order to provide at least reasonable royalty for use of the invention and damages in lost profits traceable to the infringement. *Id.* § 284; *see also* *Panduit Corp. v. Stahl Bros. Fibre Works Inc.*, 430 F.2d 221 (6th Cir. 1970) (setting forth the criteria necessary to recover damages for profits that would have been made but for the infringement), *cert. denied*, 401 U.S. 939 (1971). Section 284 also provides that the court may increase the damages up to three times the amount found. 35 U.S.C. § 284. The most common event triggering enhanced damages is willful infringement shown by the egregious conduct of the infringer. *See, e.g.*, *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 826 (Fed. Cir. 1992) (outlining factors to assist the courts in determining whether enhanced damages are warranted).

5. 1 IRVING KAYTON, *PATENT PRACTICE* 1-5 (4th ed. 1989).

6. The disclosure is required to contain a written description of the invention in terms that enable one skilled in the art to which the invention pertains to make and use the invention. 35 U.S.C. § 112. Complete disclosure of the invention so that it may be freely

what the inventor regards as the invention.<sup>7</sup> The claims provide a concise definition of the invention, used by the Patent and Trademark Office to determine whether the invention is patentable.<sup>8</sup> In addition, after issuance of a patent, the claims serve to inform the public of the limits of the exclusive right asserted, thus making known which features of the invention may and may not be used without permission from the inventor.<sup>9</sup> The conditions the claims must meet in order to be patentable are novelty, utility, and nonobviousness.<sup>10</sup> While all three conditions must be met, the standard for determining nonobviousness—codified by the Patent Act of 1952<sup>11</sup>—will be the focus of this Comment.

The issue of nonobviousness arises in the first period of patent law when the Patent and Trademark Office might reject the inventor's claims as being obvious to one of ordinary skill in the art, thus denying their patentability.<sup>12</sup> Following such a determination, the inventor has the opportunity to amend the claims or to contest the Office's finding of obvi-

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practiced upon the expiration of the 17-year patent term is viewed as the consideration given to the public in exchange for the grant of the patent. See Giles S. Rich, *The Vague Concept of "Invention" As Replaced By Sec. 103 of the 1952 Patent Act*, 46 J. PAT. OFF. SOC'Y 855 (1964) (stating that the patent system provides the necessary incentive to bring forth the efforts of inventors from which society benefits).

7. 35 U.S.C. § 112 (requiring that the claims follow the specification and "particularly point[ing] out" the "subject matter which the applicant regards as his invention").

8. Martin J. Adelman & Gary L. Francione, *The Doctrine of Equivalents in Patent Law: Questions That Pennwalt Did Not Answer*, 137 U. PA. L. REV. 673, 675 (1989).

9. General Elec. Co. v. Wabash Appliance Corp., 304 U.S. 364, 369 (1938) (stating that the claims "'measure the invention'" to protect the patentee, encourage the inventive genius of others, and assure that the invention will ultimately be dedicated to the public (quoting Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U.S. 405, 419 (1908))).

10. Jerome T. Tao, *An Examination of the Federal Circuit's Multi-Tiered Review of Patent Obviousness*, 20 AM. INTEL. PROP. ASS'N Q.J. 84, 85 (1992). The conditions of novelty and utility are beyond the scope of this Comment. For a discussion of novelty and utility, see DONALD S. CHISUM, PATENTS §§ 3.01-4.04, at 3-1 to 4-47 (1992).

11. 35 U.S.C. § 103 (1988) states, in relevant part:

A patent may not be obtained . . .

if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

*Id.*

Thus, the determination of nonobviousness involves a comparison of the claims to the teachings or disclosure of a published reference pre-dating the applicant's invention under Section 102. The reference is referred to as "prior art," and Section 103 defines the inquiry that determines whether the distinctions between the claimed invention and the prior art are sufficient to merit the grant of a patent. *Id.* § 103.

12. 35 U.S.C §§ 6(a), 103 (1988). The issue of patentability or the validity of the claims most often involves the inquiry of nonobviousness. See, e.g., Tao, *supra* note 10, at 85.

ousness in an attempt to overcome the rejection and obtain a patent grant.<sup>13</sup>

Once the claims have been approved by the Patent and Trademark Office and a patent issued for the invention, patent law's second procedural period can be utilized by the inventor to exclude others from exploiting the patented invention. This right is enforced through the federal courts in an action alleging infringement of the patent.<sup>14</sup> If, within the United States and without authorization, a third party makes, uses, or sells the invention as it has been defined in the claims, that party is liable to the patent holder for infringement of the patent.<sup>15</sup> The claims of the patent issued by the Patent and Trademark Office within the first procedural period provide the definition and scope of the invention used by the court in determining whether infringement has occurred.<sup>16</sup> Infringement of the patent can be found in either of two ways. First, literal infringement may be found where every recited element or limitation outlined by the claims is found in the infringing device.<sup>17</sup> Second, infringement may be found under the doctrine of equivalents.

The controlling issue for determining infringement under the doctrine of equivalents is whether the accused infringing device accomplishes substantially the same function, in substantially the same way, to achieve substantially the same result as the patented device.<sup>18</sup> This doctrine has been developed in order to prevent an "unscrupulous copyist"<sup>19</sup> from escaping liability for infringement simply by making minor and insubstan-

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13. All correspondence between the inventor and the Patent and Trademark Office is maintained in the application file as the official record. This record is commonly referred to as the prosecution history or the file wrapper history. See 1 KAYTON, *supra* note 5, at 2-1.

14. See *id.* at 1-7 to 1-8.

15. 35 U.S.C. § 271(a) (stating that "whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent").

16. Adelman & Francione, *supra* note 8, at 675.

17. See *Autogiro Co. v. United States*, 384 F.2d 391, 399 (Ct. Cl. 1967). In patent law, the device or structure alleged to infringe the patent is often referred to as the "accused" device. See, e.g., *id.* Analysis of literal infringement is actually a two-step process that involves interpretation of the meaning of the claim language and a direct comparison of the claim to the accused device. *Id.* at 401.

18. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 607-08 (1950) (asserting that the doctrine of equivalents exists to protect the inventor from "fraud on a patent" as limitation of infringement to literal infringement of the claim language would turn the patent into a "hollow and useless thing").

19. *Id.* at 607.

tial substitutions that would take the copied matter outside the scope of the claim language.<sup>20</sup>

The United States Court of Appeals for the Federal Circuit<sup>21</sup> has held that the doctrine of equivalents is to be applied by comparing the claims and the accused device on an element-by-element basis, with infringement under the doctrine of equivalents being found only if every element or function of the claims is matched by an equivalent in the accused device.<sup>22</sup> Notwithstanding this inquiry, recent decisions by the Federal Circuit show a willingness to soften the rigidity of the element-by-element analysis.<sup>23</sup> One more flexible approach permits "element" to be defined as either a structural element or limitation or as a series of elements in the claim.<sup>24</sup> Another approach allows a court to find that a claimed invention is a novel or "pioneer" invention, thereby found to be deserving a broader range of infringing equivalents.<sup>25</sup> In their analysis under the doc-

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20. See *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991) (stating that the doctrine of equivalents evolved from balancing the competing policies of providing fair notice to the public of the claimed invention and protecting the inventor from appropriations of the invention that barely avoid the language of the claims).

21. The Federal Circuit was created by the Federal Courts Improvement Act of 1982, 96 Stat. 25 (codified at 28 U.S.C. § 41 (1988)), and holds virtually exclusive appellate jurisdiction over patent cases. The primary policy reasons for creation of the Federal Circuit were to relieve the workload of the regional courts of appeals, provide uniformity in patent law, and to eliminate overlapping functions formerly provided by the Court of Claims and the Court of Customs and Patent Appeal. CHISUM, *supra* note 10, § 11.06[3][e], at 11-209 to 11-211.

22. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 939 (Fed. Cir. 1987) (en banc) (holding that because a single equivalent in the accused device could not be found for a claim element, there was no infringement under the doctrine of equivalents), *cert. denied*, 485 U.S. 961, and *cert. denied*, 485 U.S. 1009 (1988).

23. See, e.g., *Malta v. Schulmerich Carillons, Inc.*, 952 F.2d 1320, 1326 (Fed. Cir. 1991) (denying rehearing en banc) (stating that an element-by-element analysis is merely one possible approach); *W.L. Gore & Assocs. v. Garlock, Inc.*, 842 F.2d 1275, 1281 (Fed. Cir. 1988) (stating that the doctrine of equivalents "requires a showing that the accused process performs substantially the same overall function in substantially the same way to obtain substantially the same overall result").

24. *Sun Studs, Inc. v. ATA Equip. Leasing, Inc.*, 872 F.2d 978, 989 (Fed. Cir. 1989) (stating that one-to-one correspondence of components between the claim and the infringing device need not be found as elements may be combined without ipso facto loss of equivalency); *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1259 (Fed. Cir. 1989) (stating that "element" can mean either a structural element or limitation or a "series of limitations" in the claim). This apparent willingness to broaden the limited element-by-element approach, paired with changes in the composition of the Federal Circuit, leaves the scope of the element-by-element approach unresolved. 1 KAYTON, *supra* note 5, at 2-25 to 2-26 (discussing the views of several individual judges on the Federal Circuit).

25. See, e.g., *Sealed Air Corp. v. United States Int'l Trade Comm'n*, 645 F.2d 976, 984 (Fed. Cir. 1981) (stating that a pioneer invention that performs a function never before performed is entitled to a liberal application of the doctrine of equivalents); see also

trine of equivalents, courts often reiterate the equitable nature of the doctrine, asserting that it prevents piracy of the invention while allowing subsequent inventors to avoid infringement by designing around the claims.<sup>26</sup> The absence of a clear distinction between an equitable attempt to design around the claims and piracy has subjected the doctrine of equivalents to much debate.<sup>27</sup>

This Comment traces the formation of the Federal Circuit's current patent validity analysis, focusing on the effect of the statutory requirement of nonobviousness over the prior art. This Comment identifies the problems confronted in defining the analysis, and discusses the objective criteria that have been utilized since passage of the Patent Act of 1952. It then surveys the case law surrounding the inventor's right to exclude others from utilizing the patented invention under the second period of

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Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 1532 (Fed. Cir. 1987) (citing *Sealed Air Corp.* with approval).

26. See, e.g., *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991) (stating that the patent system promotes innovation by encouraging others to design around patent claims); *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1361 (Fed. Cir. 1983) (declaring that the doctrine of equivalents equitably prevents fraud on the patent); see also Donald R. Dunner & J. Michael Jakes, *The Equitable Doctrine of Equivalents*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 857, 865-69 (1993) (outlining the Federal Circuit's renewed emphasis on inequitable conduct by the defendant). But see Gregory J. Smith, *The Federal Circuit's Modern Doctrine of Equivalents in Patent Infringement*, 29 SANTA CLARA L. REV. 901, 914 (1989) (asserting that equitable concerns regarding the unscrupulous copyist are "overplayed" and have a "decidedly hollow ring"); Harold C. Wegner, *Equitable Equivalents: Weighing the Equities to Determine Patent Infringement in Biotechnology and Other Emerging Technologies*, 18 RUTGERS COMPUTER & TECH. L.J. 1, 4 (1992) (observing that the doctrine is often mechanistically applied with only "lip service . . . paid to its equitable origins").

27. See Adelman & Francione, *supra* note 8, at 682-83 (expressing concern that the doctrine leads to unpredictable litigation outcomes, expansion of claim scope to the extent that the claims no longer provide notice to the public, and abusive infringement actions); Richard M. Klein, *Establishing Infringement Under the Doctrine of Equivalents After Malta*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 5, 6-7 (1993) (stating that a great deal of ambiguity remains as to the precision required when comparing each element or limitation in a claim to an accused object). Uncertainty in patent law invites protracted and complex litigation, the increase of which may hinder technological innovation. See Henrik D. Parker, *Doctrine of Equivalents Analysis After Wilson Sporting Goods: The Hypothetical Claim Hydra*, 18 AM. INTELL. PROP. L. ASS'N Q.J. 262, 266 (1990) (recognizing the need to simplify patent litigation); Nancy Rutter, *The Great Patent Plague*, FORBES, Mar. 29, 1993, at 59-66 (detailing complaints that aggressive and costly patent litigation by large companies stifles entrepreneurship in high-technology fields).

The Federal Circuit, recognizing these problems, has recently ordered *sua sponte* en banc hearing of the following issues: (1) whether a finding of infringement under the doctrine of equivalents requires anything in addition to the tripartite function-way-result test, and if so what, (2) whether the trial court's application of the doctrine of equivalents is discretionary, and (3) whether the doctrine of equivalents is an equitable remedy to be decided by the court or an issue of fact to be decided by the jury. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, No. 93-1088 (Fed. Cir. Dec. 23, 1993).

patent law. This Comment further analyzes infringement under the doctrine of equivalents, and again, identifies the policies that drive the courts' analysis and the problems of definition. Because the analysis under both nonobviousness and the doctrine of equivalents focuses on the difference between the claims and an outside standard, this Comment compares the requirements of each analysis. This Comment concludes that the policies and problems of each analysis are analogous and, accordingly, the uncertainties surrounding the current application of the doctrine of equivalents should be resolved by increased emphasis on objective considerations such as the relevant prior art and the pioneering nature of the claimed invention.

### I. OBVIOUSNESS: A COMPARISON OF THE CLAIMS AND THE PRIOR ART

The determination as to whether an invention is patentable relates to both procedural periods of patent law. The condition of nonobviousness necessary for a finding of patentability arises both in the period of procurement, where an inventor asserts to the Patent Office that the invention is not obvious,<sup>28</sup> and also in the enforcement of the patent, where a defendant in an infringement suit asserts the defense that the patented claims, although approved by the Patent Office, are obvious and therefore invalid.<sup>29</sup>

#### A. *Case Law Prior to the Patent Act of 1952: The Supreme Court's Reluctance to Define a Principled and Objective Test*

The earliest patent statutes enacted by Congress identified novelty as the single test for patentability.<sup>30</sup> The Act of 1793, for example, provided that a patent would be issued on any machine, manufacture, or composition of matter that was "new and useful."<sup>31</sup> In addition, the Act contained a provision denying patentability to small changes in the form or structure of known devices and compositions.<sup>32</sup> The basic elements of this Act remain valid today, and thus, the essential issue for more than

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28. See *supra* notes 11-13 and accompanying text.

29. See 35 U.S.C. §§ 103, 282 (1988) (stating that a plea of patent invalidity because the claims would have been obvious to one of ordinary skill in the art is a defense to infringement).

30. See Edmund W. Kitch, *Graham v. John Deere Co.: New Standards for Patents*, 1966 SUP. CT. REV. 293, 303.

31. Act of February 21, 1793, ch. 11, § 1, 1 Stat. 318, 319 (repealed 1836).

32. Section 2 of the Act stated that "simply changing the form or the proportions of any machine, or composition of matter, in any degree, shall not be deemed a discovery." § 2, 1 Stat. at 321. Accord Kitch, *supra* note 30, at 318.

two hundred years has been whether a novel invention is sufficiently distinct from the prior art to warrant patentability.<sup>33</sup>

Under this statutory background, in the mid-nineteenth century the United States Supreme Court issued its decision in *Hotchkiss v. Greenwood*.<sup>34</sup> *Hotchkiss* involved a plaintiff who brought suit alleging that his patent was infringed upon by the defendant.<sup>35</sup> The patented invention at issue was a doorknob attached to a shank device, with the claimed improvement consisting of a knob made of clay or porcelain instead of the conventionally used metal.<sup>36</sup> Greenwood, who was alleged to have violated the patent, asserted in defense that the patent was void because the only change over the prior art was the use of porcelain instead of metal.<sup>37</sup> In its opinion, the Court declared that in order to be patentable, the invention must illustrate a level of skill surpassing that of the ordinary person in that particular field.<sup>38</sup> Finding that the application of the well-known shank-to-knob fastening configuration to porcelain instead of metal did not show the requisite level of skill required for patentability, the Court held the patent to be invalid and thus not infringed.<sup>39</sup>

While *Hotchkiss* is widely recognized as the foundation for the current legal analysis of nonobviousness,<sup>40</sup> following the Court's opinion the question of what differences between a claimed device and the prior art were sufficient for patentability was far from settled. In *Smith v. Nichols*,<sup>41</sup> the Court again examined the issue of what differences are considered a sufficient advance from the prior art to merit patentability.<sup>42</sup> In *Nichols*, the plaintiff patented an improved fabric made by incorporating longitudinal elastic threads in a stretched position with a weave of threads passing over and under the stretched elastic.<sup>43</sup> Upon completion of the weaving process, the elastic released back to the unstretched position providing for a stronger, more tightly woven fabric.<sup>44</sup> The plaintiff sought to prevent the defendant from using the patented fabric; in response, the

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33. ROBERT A. CHOATE, CASES AND MATERIALS ON PATENT LAW 304 (1987).

34. 52 U.S. (11 How.) 248 (1851).

35. *Id.* at 249-50.

36. *Id.*

37. *Id.* at 257.

38. *Id.* at 267. The Court stated that a patentable invention required "more ingenuity and skill . . . than were possessed by an ordinary mechanic acquainted with the business." *Id.*

39. *Id.* at 265, 267.

40. See CHISUM, *supra* note 10, § 5.02[1], at 5-10.

41. 88 U.S. (21 Wall.) 112 (1875).

42. *Id.* at 117.

43. *Id.* at 116.

44. *Id.*



defendant argued that the patent was invalid for lack of novelty.<sup>45</sup> The Court noted that a fabric of virtually the same construction as that patented was publicly used before the plaintiff's invention, but with inferior qualities of tightness and beauty.<sup>46</sup> In spite of these advances in quality, the Court declared that "a change only in form, proportions, or degree, the substitution of equivalents, doing substantially the same thing in the same way by substantially the same means with better results, is not such invention as will sustain a patent."<sup>47</sup> Applying this rule, the Court found that the difference or improvement of the patented fabric over the prior art was merely one of degree and, therefore, the patent was invalid.<sup>48</sup> Reflecting the analysis of the level of skill in the relevant field articulated in *Hotchkiss*, the Court stated that a patentable invention was "a mental result,"<sup>49</sup> suggesting that the focus of its analysis was shifting from the invention per se to the inventor's mental process in conceiving the invention.<sup>50</sup>

In spite of the Court's ruling in *Nichols*, patent law continued to lack an exclusive or even principled analysis of what distinctions over the prior art were patentable.<sup>51</sup> In *Smith v. Goodyear Dental Vulcanite Co.*,<sup>52</sup> the defendant in a patent infringement suit again raised the defense that the patent was invalid for lack of novelty.<sup>53</sup> The patent at issue claimed an improvement in artificial teeth by using a supporting plate of vulcanized rubber instead of gold plates to support the teeth.<sup>54</sup> The Supreme Court examined the issue of whether the patent was invalid because the claims were merely the substitution of hard rubber for the same use, in substantially the same manner, and with the same effect of substances previously

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45. *Id.* at 117.

46. *Id.*

47. *Id.* at 119. One cannot help but wonder if the Court, resolving the issue of validity, envisioned analysis of a patent's validity and infringement under similar standards by expressly referring to a "substitution of equivalents, doing substantially the same thing in the same way by substantially the same means with better results." *Id.*; see also *Machine Co. v. Murphy*, 97 U.S. 120, 124 (1878) (holding that a device will infringe a patent where it performs "substantially the same function in substantially the same way to obtain the same result"); *Winans v. Denmead*, 56 U.S. (15 How.) 330, 344 (1854) (holding on the issue of infringement, that a mere change in form from patentee's invention so as to use substantially the same mode of operation to achieve the same kind of result constituted infringement). The use of identical language in addressing the issues of validity and infringement shows the Court's implicit recognition that the issues are analogous.

48. *Smith*, 88 U.S. (21 Wall.) at 119.

49. *Id.* at 118.

50. Kitch, *supra* note 30, at 318.

51. *Id.* at 319.

52. 93 U.S. 486 (1877).

53. *Id.* at 489.

54. *Id.* at 490.

used in manufacturing artificial teeth.<sup>55</sup> Such a substitution, the Court stated, would amount to “no invention.”<sup>56</sup> The Court noted that setting the teeth in the rubber while it was in a plastic condition formed a unitary piece, having the benefits of better fit, lighter weight, and sufficient flexibility and strength.<sup>57</sup> On this basis, the Court held that the patent was not a mere substitution, but was “in truth, invention.”<sup>58</sup> Thus, the Court signalled that the presence or absence of “invention” was the ultimate issue upon which validity of a patent would turn.<sup>59</sup>

Following the Supreme Court’s decision in *Goodyear Dental*, courts applied the invention requirement of patentability on a case-by-case basis.<sup>60</sup> The problem inherent in defining invention was admitted, and general criteria for such a test were rejected.<sup>61</sup> Most often, the requirement of invention or novelty was merged with the requirement of nonobviousness set forth in *Hotchkiss*.<sup>62</sup>

*Cuno Engineering Corp. v. Automatic Devices Corp.*<sup>63</sup> represented a further attempt by the Supreme Court to articulate what advances in the art warrant patentability. The patented device at issue in *Cuno Engineering* was a wireless, removable cigarette lighter for automobiles, designed

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55. *Id.* at 492.

56. *Id.*

57. *Id.* at 493-95.

58. *Id.* at 495.

59. CHISUM, *supra* note 10, § 5.02[1], at 5-13 (outlining the historical development of patent law in the late nineteenth century).

60. See, e.g., *Hollister v. Benedict & Burnham Mfg. Co.*, 113 U.S. 59, 72 (1885) (holding a patent invalid because the claimed invention did not “spring from that intuitive faculty of the mind put forth in the search for new results or new methods, creating what had not before existed”); *Vulcan Corp. v. Slipper City Wood Heel Co.*, 89 F.2d 109, 110 (6th Cir. 1937) (holding a patent invalid because the invention was not the result of “some flash of genius, inspiration, or imagination”); *United Chromium, Inc. v. International Silver Co.*, 53 F.2d 390, 393 (D. Conn. 1931) (holding a patent invalid and stating that “[p]atentable novelty” was found in discovering the difficulty of an existing structure and correcting that difficulty), *modified*, 60 F.2d 913 (2d Cir. 1932), *cert. denied*, 288 U.S. 600 (1933); *Pyrene Mfg. Co. v. Boyce*, 292 F. 480, 481 (3d Cir.) (defining “[i]nvention” as “a concept; a thing evolved from the mind” that is “the creation of something which did not exist before”), *cert denied*, 263 U.S. 723 (1923).

61. See *McClain v. Ortmyer*, 141 U.S. 419, 427 (1891) (stating that “whether the variation relied upon in a particular case is anything more than ordinary mechanical skill is a question which cannot be answered by applying the test of any general definition”); *Sachs v. Hartford Elec. Supply Co.*, 47 F.2d 743, 748 (2d Cir. 1931) (stating that “[s]uch a standard is no more of a will-o'-the-wisp than others which the law adopts . . . . Any attempt to define it in general terms has always proved illusory; it is best to abandon it.”). Judge Learned Hand would later comment that the concept of “invention” is “as fugitive, impalpable, wayward, and vague a phantom as exists in the whole paraphernalia of legal concepts.” *Harries v. Air King Prods. Co.*, 183 F.2d 158, 162 (2d Cir. 1950).

62. *Kitch*, *supra* note 30, at 323.

63. 314 U.S. 84 (1941).

to operate so that the igniter was heated when placed in position.<sup>64</sup> Upon reaching the proper temperature, a thermostatic control caused a spring to automatically return the igniter to the off position, leaving the lighter ready for use.<sup>65</sup> Previously, cigarette lighters required the driver to hold the igniter in the on position until he observed or guessed that the temperature was sufficiently hot.<sup>66</sup>

Articulating the rule that a patentable device must reveal a "flash of creative genius,"<sup>67</sup> the Court held that the well-known use of thermostatic controls to provide automatic temperature control for electric heaters, irons, coffee makers, bread toasters, and nonremovable cigarette lighters rendered the patent invalid.<sup>68</sup> The Court further urged that the flash of creative genius test be applied strictly to mitigate against a finding of patentability.<sup>69</sup>

### B. *The Patent Act of 1952: Congressional Response to Cuno Engineering*

Patent law was thrown into a state of turmoil following *Cuno Engineering*, as practitioners struggled to define the requirements of creative flashes of genius.<sup>70</sup> Rather than clarifying the law, the Supreme Court's

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64. *Id.* at 86.

65. *Id.* at 86-87.

66. *Id.*

67. *Id.* at 91. Justice Douglas declared that "the new device, however useful it may be, must reveal the flash of creative genius, not merely the skill of the calling. If it fails, it has not established its right to a private grant on the public domain." *Id.*

68. *Id.* at 88-89.

69. Justice Douglas' hostility towards patents representing small deviations from known technology is evident in the following passage:

Strict application of that test is necessary lest in the constant demand for new appliances the heavy hand of tribute be laid on each slight technological advance in an art. The consequences of the alternative course were forcefully pointed out by Mr. Justice Bradley in *Atlantic Works v. Brady*, 107 U.S. 192, 200: "Such indiscriminate creation of exclusive privileges tends to obstruct rather than to stimulate invention. It creates a class of speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies, which enable them to lay a heavy tax upon the industry of the country, without contributing anything to the real advancement of the arts. It embarrasses the honest pursuit of business with fears and apprehensions of concealed liens and unknown liabilities to lawsuits and vexatious accounting for profits made in good faith."

*Id.* at 92.

70. *Cuno Engineering* prompted a flood of commentary by those in the field. See P.J. Federico, *Origins of Section 103*, 5 AM. PAT. L. ASS'N Q.J. 87, 97 n.5 (1977) (suggesting that the "'flash of creative genius'" language of *Cuno Engineering* was likely a "rhetorical flourish," but, coupled with the resulting commentary, led to a higher standard of invention in the lower courts). Indeed, practitioners attempted to either explain the holding or advocate a more uniform test. See, e.g., Robert S. Allyn, *Patentable Yardsticks*, 25 J. PAT. OFF.

holding in *Cuno Engineering* only aggravated the uncertainty inherent in *Goodyear Dental's* test of "invention."<sup>71</sup>

In the 1950s, Congress undertook to revise the patent statutes with the hope of counteracting the perceived effect of *Cuno Engineering*, seeking to satisfy the long-felt need for a statutory definition of those changes from the prior art meriting patentability.<sup>72</sup> The result was section 103 of the Patent Act of 1952.<sup>73</sup> Congress' purpose<sup>74</sup> in enacting section 103 was to convey the subjective question of "what is invention?" in as objective terms as possible.<sup>75</sup> The hope was to provide a degree of uniformity to the determination of patentability, thereby reducing the numerous ap-

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SOC'Y 791, 811-13 (1943) (arguing that "flash of creative genius" as used by the Supreme Court did not change the standard of invention but merely restated the previous standard in altered words); Otto Raymond Barnett, *The "Flash of Genius" Fallacy*, 25 J. PAT. OFF. SOC'Y 785, 786-89 (1943) (criticizing the flash of genius test as precluding the results of reasoned investigation from being eligible for patentability); Aram Boyajian, *The Flash of Creative Genius An Alternative Interpretation*, 25 J. PAT. OFF. SOC'Y 776, 776-81 (1943) (outlining four previous interpretations of *Cuno Engineering*, and providing a fifth focusing on the creative idea embodied within the device and not the mental process from which it evolved); William D. Sellers, *The Flash of Genius Doctrine Approaches the Patent Office*, 26 J. PAT. OFF. SOC'Y 275, 275 (1944) (citing *Potts v. Coe*, 60 U.S.P.Q. (BNA) 226 (1944), to show that the flash of creative genius test changed the manner in which the Patent Office determines patentability); S. Spintman, *Has the Standard of Invention Been Raised?*, 27 J. PAT. OFF. SOC'Y 422, 422 (1945) (concluding that the flash of creative genius test had no effect on the manner in which the Patent Office determines patentability and that it is in fact but one of many tests of patentability).

71. See *supra* notes 51-62 and accompanying text.

72. See Federico, *supra* note 70, at 87 (1977); L. James Harris, *Some Aspects of the Underlying Legislative Intent of the Patent Act of 1952*, 23 GEO. WASH. L. REV. 658, 674 n.62 (1955); Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 405-06 (1960). The influence of Federico, Harris, and Rich on the drafting of Section 103 is widely recognized, with Federico credited as the primary author of the statute. See, e.g., Louis S. Zarfes, *Notes from the Editor*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 160 (1993) (quoting S. J. Crumpacker, *Symposium on Patents*, 1962 SUMMARY PROC., SEC. PAT., TRADEMARKS & COPYRIGHT L. 141, 143).

73. 35 U.S.C. § 103 (1988) requires that a patent may not be obtained if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

*Id.*

74. For a frank discussion of the significance of congressional intent as it pertains to section 103, see Giles S. Rich, *Congressional Intent—Or, Who Wrote the Patent Act of 1952?*, in *PATENT PROCUREMENT & EXPLOITATION* 61 (1963) (stating that the only "intent" relevant is that of a subcommittee to pass a bill written by patent lawyers and agreed to by counsel for the subcommittee and its members), reprinted in JOHN F. WITHERSPOON, *NOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY* 1:1 (1980).

75. Harris, *supra* note 72, at 675.

proaches various courts had taken to the issue.<sup>76</sup> To this end, the use of the indefinite term "invention" was omitted, authoritatively requiring nonobviousness to be the test for patentability.<sup>77</sup> In addition, the mode of analysis for nonobviousness was altered to look to what the hypothetical person of ordinary skill in the art would have known at the time of the invention.<sup>78</sup> This inquiry represents the touchstone of a principled analysis that is a far cry from the former tests of substantial equivalents, invention, creative faculty, and creative flashes of genius.<sup>79</sup>

### C. Judicial Response to Section 103: The Emergence of Objective Criteria

The change section 103 made in the determination of patentability was not immediately recognized, however, and courts continued to rely on the old standard of invention after the passage of section 103.<sup>80</sup> Debate ensued as to whether the new Act merely codified prior case law on the standard of invention or mandated a different analysis.<sup>81</sup> While a change was intended,<sup>82</sup> the new statute was not designed to categorize specific criteria for patentability in detail, but rather to provide a basis for courts to later add further criteria to the analysis.<sup>83</sup>

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76. H.R. Rep. No. 1923, 82nd Cong., 2d Sess. 7 (1952), *reprinted in* 34 J. PAT. OFF. SOC'Y 549, 557 (1952) (stating that "[t]his section should have a stabilizing effect and minimize great departures which have appeared in some cases").

77. Rich, *supra* note 72, at 405.

78. 35 U.S.C. § 103 (1988).

79. Rich, *supra* note 72, at 405-06 (asserting that the analysis set forth in section 103 requires the Patent Office and courts to articulate a definite pattern of thinking to justify validity decisions).

80. *See* General Radio Co. v. Superior Elec. Co., 321 F.2d 857, 862 (3d Cir. 1963) (stating that a patentable invention is a new and useful means to achieve a desired result, and not merely the functions attributed to the means), *cert. denied*, 376 U.S. 938 (1964); *In re O'Keefe*, 202 F.2d 767, 771 (C.C.P.A. 1953) (stating that the Patent Act of 1952 neither lowered, nor raised the standard of invention); *New Wrinkle, Inc. v. Watson*, 206 F.2d 421, 422 n.6 (D.C. Cir. 1953) (stating that because "non-invention" was so "clear" in that case there was no need to determine the scope of the analysis required by section 103).

81. *See* *Lyon v. Bausch & Lomb Optical Co.*, 224 F.2d 530, 535 (2d Cir.) (raising the issue of whether section 103 changed the previous standard for patentability and holding in the affirmative), *cert. denied*, 350 U.S. 911 (1955). For a criticism of *Lyon*, see *Vermont Structural Slate Co. v. Tatko Bros. Slate Co.*, 233 F.2d 9, 11 n.3 (2d Cir.) (citing holdings of other circuits to show that section 103 merely codified the prior standard), *cert. denied*, 352 U.S. 917 (1956).

82. *See supra* notes 72-79 and accompanying text.

83. P.J. Federico, *Commentary on the New Patent Act*, 35 U.S.C.A. § 103 (West 1954), *reprinted in* 75 J. PAT. & TRADEMARK OFF. SOC'Y 161, 184 (1993) (discussing the effects that section 103 was intended to have on the standard of patentability).

The addition of further analytical criteria finally came from the Supreme Court in *Graham v. John Deere Co.*<sup>84</sup> In *Graham*, the Court held that the issue of nonobviousness under section 103 was determined by a three-part factual inquiry.<sup>85</sup> Under this inquiry, the scope and content of the prior art are first determined. Second, the differences between the prior art and the claims at issue are ascertained; and third, the level of skill in the pertinent art is resolved.<sup>86</sup> The facts developed under the three-part inquiry determine whether the claims would have been obvious to one of ordinary skill in the art.<sup>87</sup>

Applying this analysis to the facts in *Graham*, the claims at issue defined a chisel plow constructed so that the chisel of the plow would raise out of the ground upon contact with impediments such as heavy rocks, thereby avoiding breakage.<sup>88</sup> The chisel of the plow was in the shape of a fishhook, with the shank attached to the topside of a hinged plate.<sup>89</sup> The fulcrum of the hinged plate was attached to an upper plate and the forward end was held against the upper plate with a heavy spring.<sup>90</sup> This arrangement was similar to devices in the prior art except that in the prior art, the shank of the chisel plow was attached to the underside of the hinged plate with an additional bracket holding the two parts in contact.<sup>91</sup> The additional bracket served to distribute evenly the stress caused by a rock along the length of the shank rather than only that portion of the shank in contact with the hinged plate.<sup>92</sup>

Having considered both the scope of the prior art and the difference between the prior art and the claims, the Court noted that the bracket of the prior art served the same function as the claimed improvement of attaching the shank to the topside of the hinged plate, that is, distributing stress evenly along the length of the shank.<sup>93</sup> The Court accepted this as a showing that one of ordinary skill in the art could recognize that the plow was more effective with an even distribution of stress.<sup>94</sup> The Court held, upon completion of the three-part inquiry, that the modification of

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84. 383 U.S. 1 (1966).

85. *Id.* at 17.

86. *Id.*

87. *Id.* The Court further specified that objective facts, such as the commercial success of the invention, the long felt need in the relevant art, and the failure of others to successfully complete the invention, may be used as secondary indicia of nonobviousness. *Id.* at 17-18.

88. *Id.* at 19-20.

89. *Id.* at 20.

90. *Id.*

91. *Id.* at 22-23.

92. *Id.* at 23.

93. *Id.*

94. *Id.* at 24-25.

inverting the shank and the hinged plate would have been obvious, and declared the claims invalid.<sup>95</sup>

Section 103 was further clarified in *ACS Hospital Systems, Inc. v. Montefiore Hospital*.<sup>96</sup> In this case, the United States Court of Appeals for the Federal Circuit addressed the issue of whether evidence of a teaching or incentive to combine separate prior art references is required to render a claimed invention obvious.<sup>97</sup> The plaintiff in the case patented a television system for rental use that could be locked in an off position by a key operator.<sup>98</sup> For rental use, the system had an override switch that, when depressed by the viewer, enabled the television to operate normally without turning on the key operator switch.<sup>99</sup> The override switch activated an indicator signal, thus showing that a person had rented the television.<sup>100</sup> The patent owner sued the defendant for infringement of the claims, and the defendant asserted the patent's invalidity under section 103.<sup>101</sup> In applying the *Graham* analysis, the trial court found that the difference between the patent claims and the prior art was obvious, stating that "the overriding of switches by providing an alternative path for current to actuate an appliance is a commonly practiced technique well known in the art."<sup>102</sup> The Federal Circuit reversed, ruling that in order to invalidate a patent, the prior art must teach or motivate one of ordinary skill in the art to combine two known elements to make a new device.<sup>103</sup> The court noted first that the use of override switches in a wide variety of applications was not relevant to the claimed subject matter as a whole—television rental switches.<sup>104</sup> Because the trial court identified no source in the prior art for the suggestion of using an override switch in a rental television,<sup>105</sup> the citation of unrelated elements to show obviousness was improperly the product of hindsight reconstruction of the claimed subject matter.<sup>106</sup> The Federal Circuit thereby stressed the importance of another factual finding needed to support a conclusion of obviousness.<sup>107</sup>

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95. *Id.*

96. 732 F.2d 1572 (Fed. Cir. 1984).

97. *Id.* at 1577.

98. *Id.* at 1574.

99. *Id.*

100. *Id.*

101. *Id.*

102. *Id.* (quoting trial court's opinion).

103. *Id.*

104. *Id.* at 1576.

105. *Id.* at 1577.

106. *Id.*

107. See also *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983) (stating that a prior art reference must convey or suggest knowledge of the invention to

Throughout the history of the United States patent system, Congress and the courts have grappled with the problem of defining what changes in current technology merit patentability.<sup>108</sup> This task is often a difficult one, and remains the subject of debate today. However, because the Supreme Court and the Federal Circuit<sup>109</sup> took the initiative to increase the focus on objective criteria within the confines of the statutory language, the current obviousness standard is a marked improvement over the subjectivity of the prior tests.<sup>110</sup>

## II. THE DOCTRINE OF EQUIVALENTS: A COMPARISON OF THE CLAIMS AND THE WORK OF AN ACCUSED INFRINGER

In contrast to the successful use of objective criteria to determine issues of obviousness, the role of objective criteria in the doctrine of equivalents remains unsettled. When expanding the scope of the claim language to embrace equivalent structures in the alleged infringing device, the courts have neither clearly nor consistently required analysis of the prior art, the pioneering nature of the patented invention, and direct evidence of copying by the defendant.

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avoid the "insidious effect" of hindsight reconstruction), *cert. denied*, 469 U.S. 851 (1984). The Federal Circuit also has emphasized the role of secondary, objective evidence, as discussed by the Supreme Court in *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) (noting the potential use of commercial success, failure of others to accomplish that which the claims accomplish, and a long felt need in the art). *See, e.g., Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 961 (Fed. Cir. 1983) (recognizing that the commercial success and teachings in the prior art that would lead one away from the claimed invention are "highly probative, objective criteria fully capable of serving as a foundation for the legal conclusion of nonobviousness"), *cert. denied*, 469 U.S. 835 (1984); *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1360 (Fed. Cir. 1983) (citing, as evidence of nonobviousness, the previous unsuccessful efforts of others to solve the problem corrected by the claimed invention, and the previous belief of experts that the problem could not be solved).

108. *See supra* notes 30-79 and accompanying text.

109. The analysis of *Graham*, however, did not provide immediate uniformity. Various circuits remained hostile to the validity of patents despite the analysis mandated by section 103. *See* COMM. ON REVISION OF THE FEDERAL COURT APPELLATE SYSTEM, STRUCTURE AND INTERNAL PROCEDURES: RECOMMENDATIONS FOR CHANGE, 67 F.R.D. 195, 370-71 (1975) (the Hruska Commission) (finding that the sparseness of Supreme Court decisions on the issue of obviousness led to extreme instances of forum shopping where patentees "scramble to get into the 5th, 6th, and 7th circuits since the courts there are not inhospitable to patents whereas infringers scramble to get anywhere but in these circuits" (quoting Letter from James B. Gambrell and Donald R. Dunner, Commission Patent Law Consultants, to the Hruska Commission)). The findings of the Hruska Commission led to the formation of the Federal Circuit. *See* H.R. Rep. No. 312, 97th Cong., 1st Sess. 21 (1981) (quoting the findings of the Hruska Commission).

110. Rich, *supra* note 72, at 405.



A. *The Tripartite Function-Way-Result Test as Defined in Graver Tank*

In *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*,<sup>111</sup> the Supreme Court stated that the doctrine of equivalents applies where the infringing device performs the same function in substantially the same way to achieve substantially the same result.<sup>112</sup> In *Graver Tank*, the patentee sued the defendant for infringing upon claims in a patent to a welding flux containing an alkaline earth metal silicate.<sup>113</sup> The defendant's flux contained manganese silicate, which is not an alkaline earth metal silicate and did not literally infringe the claims.<sup>114</sup> Accordingly, the issue in the case was whether manganese silicate was equivalent to an alkaline earth metal silicate.<sup>115</sup>

The Supreme Court first expanded on the underlying policies of the doctrine of equivalents.<sup>116</sup> It stated that "imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing" and that without the doctrine, patent protection analysis would be "at the mercy of verbalism and would be subordinating substance to form."<sup>117</sup> The Court further noted that the doctrine "is not the prisoner of a formula" but that an important factor was whether the flux ingredients were known to be interchangeable by those skilled in the welding art.<sup>118</sup>

Applying the tripartite function-way-result test to the facts in *Graver Tank*, the Court held the patent to be infringed because the manganese and alkaline earth metals operated in the same way to achieve the same result.<sup>119</sup> The Court also noted the art-recognized similarities between the manganese and alkaline earth metals as evidence that the two had the

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111. 339 U.S. 605 (1950).

112. *Id.* at 608.

113. *Id.* at 606.

114. *Id.* at 611.

115. The district court held four of the flux claims that were limited to alkaline earth metal silicates to be valid and infringed. *Id.* at 606. Claims embracing "'metallic silicates'" or "'silicates'" were held to be invalid as embracing metals that were inoperative to the invention. *Id.* However the specification of the patent disclosed manganese to be operable. *Id.* The Seventh Circuit reversed the district court regarding the claims held invalid. *Id.* The Supreme Court reversed the appellate court and reinstated the district court decree. *Id.* Rehearing was granted, limited to the issue of infringement and the applicability of the doctrine of equivalents. *Id.*

116. *Id.* at 607-10.

117. *Id.* at 607.

118. *Id.* at 609.

119. *Id.* at 611.

same function in the welding fluxes.<sup>120</sup> On this basis, the Court found the claims to be infringed.<sup>121</sup>

In a dissenting opinion, Justice Black argued that wide application of the doctrine of equivalents would erode the requirement that the claims particularly point out what the applicant regards as the invention.<sup>122</sup> This requirement was important, Justice Black stated, in that it serves to place the public on notice as to what the patent protects.<sup>123</sup> Justice Black concluded by arguing that expansion of the claim's scope through the doctrine of equivalents would lead to retroactive infringement actions and defeat the authority of the Patent Office initially to determine the patentable scope of the claims.<sup>124</sup>

*B. Element by Element Comparison of the Claims and the Accused Device is Required by the Federal Circuit*

Competing interests of prevention of fraud on a patent and notice to the public as outlined in the majority and dissenting opinions of *Graver Tank* provide the background against which all issues under the doctrine of equivalents are heard.<sup>125</sup> In *Hughes Aircraft Co. v. United States*,<sup>126</sup> the Federal Circuit faced the problem of what may be considered an equivalent. Hughes Aircraft owned the patent rights to a device that provided satellites with an improved means for attitude control.<sup>127</sup> The control system was claimed to have the ability to detect its own position relative to the sun by means of an on-board sensor, and to transmit the orientation signal to ground control.<sup>128</sup> The satellite also had the ability to receive a control signal from the ground, determined in response to the orientation signal, and could change its position as directed by the ground control signal.<sup>129</sup> The accused satellite was alleged to be in violation of

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120. *Id.* at 610-11.

121. *Id.* at 620.

122. *Id.* at 613 (Black, J., dissenting).

123. *Id.* at 617.

124. *Id.* at 615.

125. See William E. Eshelman, Comment, *The Doctrine of Equivalents in Patent Law: Post-Pennwalt Developments*, 65 TUL. L. REV. 883, 884 (1991) (discussing *Graver Tank* as the seminal precedent in equivalency issues).

126. 717 F.2d 1351 (Fed. Cir. 1983).

127. *Id.* at 1353. "Attitude" refers to the orientation of a spacecraft's spin axis to the earth. See U.S. Patent 3,758,051, column 11, lines 34-45.

128. *Hughes Aircraft*, 717 F.2d at 1364.

129. *Id.* at 1353, 1364. The specific claim language was in the form of means plus function limitations provided for by 35 U.S.C. § 112 (1988). In interpreting such language, the patent specification limits the claim language as to what structure literally infringes the claim. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 934 (Fed. Cir. 1987), *cert. denied*, 485 U.S. 961, and *cert. denied*, 485 U.S. 1009 (1988). If the accused device performs

Hughes' patent, but had a system for attitude control that differed from Hughes' patent claims by processing the orientation signal through an on-board computer, rather than processing the signal through ground control.<sup>130</sup> The on-board computer then activated a jet for proper positioning of the satellite.<sup>131</sup>

The district court held that the doctrine of equivalents did not apply because there was no obvious and exact equivalent in the accused satellite for the claimed ability to send the orientation signal to ground control or the ability to receive a control signal to activate the jet.<sup>132</sup> The court compared Hughes' patent claims to the prior art.<sup>133</sup> The court stated that the claims at issue did not represent a "pioneer"<sup>134</sup> invention because the prior art taught the basic principle of adjusting a satellite position by pulsed jet propulsion.<sup>135</sup> Therefore, the range of possible equivalents was considerably narrowed.<sup>136</sup>

The Federal Circuit reversed, stating that the claimed invention must be considered as a whole when applying the doctrine of equivalents.<sup>137</sup> Thus, the trial court erred by requiring an obvious and exact equivalent for the satellite's ability to send and receive signals.<sup>138</sup> The appellate court's opinion noted that demanding an equivalent for each element in the claims be found in the accused device is a requirement of literal infringement.<sup>139</sup> The court found that the on-board computer—technology not available at the time the claims were patented<sup>140</sup>—achieved the same function in substantially the same way to achieve the same result as the control system of the patented satellite.<sup>141</sup>

The effect of the requirement of *Hughes Aircraft*—that the claimed invention be considered as a whole—was reconsidered by the Federal Cir-

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the same function with a structure that is different from but equivalent to that of the specification, then literal infringement is found. *Id.*

130. *Hughes Aircraft*, 717 F.2d at 1364.

131. *Id.* at 1360-61.

132. *Id.* at 1364.

133. *Id.* at 1362.

134. A "pioneer" invention is entitled to a wide range of equivalents. *Corning Glass Works v. Anchor Hocking Glass Corp.*, 374 F.2d 473, 476 (3d Cir.), *cert. denied*, 389 U.S. 826 (1967).

135. *Hughes Aircraft*, 717 F.2d at 1362.

136. *Id.*

137. *Id.* at 1364.

138. *Id.*

139. *Id.*

140. The fact that an accused device incorporates an improvement on the claimed device is not sufficient to preclude application of the doctrine of equivalents. *Morley Sewing Mach. Co. v. Lancaster*, 129 U.S. 263, 273 (1889).

141. *Hughes Aircraft*, 717 F.2d at 1363, 1365.

cuit in *Pennwalt Corp. v. Durand-Wayland, Inc.*<sup>142</sup> In that case, the patentee brought suit alleging patent infringement on claims for a fruit sorter.<sup>143</sup> The claimed machine sorted fruit according to color and weight.<sup>144</sup> As a piece of fruit passed through the sorter, its location was continuously recorded by a position-indicating mechanism.<sup>145</sup> The accused sorter had no equivalent means for continuously tracking and storing the position of each piece of fruit, but rather used a software queue for sorting.<sup>146</sup> The district court held that the accused sorter had no components that performed a function within the range of equivalents for the position-indicating mechanism.<sup>147</sup>

The Federal Circuit affirmed the trial court in finding that the accused sorter had no equivalent for the claimed continuous position-indication mechanism.<sup>148</sup> The majority applied an element-by-element analysis without considering the claim as a whole.<sup>149</sup> The majority first noted the testimony of the plaintiff's witness that the accused sorter "could" be used to track the position of the fruit.<sup>150</sup> As to the substitution of software and a computer in the accused device for the hard wired components of the claims, the majority did not find the claimed function of continuous position tracking in the software of the accused device.<sup>151</sup> Therefore, no equivalent for the continuous position indicating element could be found.<sup>152</sup> The majority also noted that the position indicating mechanism limitation was inserted to overcome a prior art rejection

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142. 833 F.2d 931 (Fed. Cir. 1987) (en banc), *cert. denied*, 485 U.S. 961, and *cert. denied*, 485 U.S. 1009 (1988).

143. *Id.* at 932-33.

144. *Id.*

145. *Id.*

146. *Id.* at 934.

147. *Pennwalt Corp. v. Durand Wayland, Inc.*, 225 U.S.P.Q. (BNA) 558, 572 (N.D. Ga. 1984), *aff'd in part, vacated in part*, 833 F.2d 931 (Fed. Cir. 1987) (en banc), *cert. denied*, 485 U.S. 961, and *cert. denied*, 485 U.S. 1009 (1988).

148. *Pennwalt*, 833 F.2d at 938.

149. *Id.* at 935. Judges Bennett and Newman criticized the majority for failing to discuss or distinguish the precedent requiring consideration of the claim as a whole. *Id.* at 939, 954-55 (Bennett & Newman, JJ., dissenting). Judge Nies responded by asserting that the majority holding did not overturn *Hughes Aircraft*, but rather applied the "all elements rule." *Id.* at 949 (Nies, J., additional views). The "all elements rule" is a universal rule of claim construction requiring a finding of no infringement when a claim limitation is not present in the accused device either literally or equivalently. *Id.* Judge Nies maintained that this rule was in fact applied in *Hughes Aircraft*, although not expressly stated therein, thus making the majority holding in fact consistent with *Hughes Aircraft*. *Id.*

150. *Id.* at 937 (majority opinion).

151. *Id.* at 938-39.

152. *Id.*

made by the Patent Office, and thus the doctrine of "file wrapper estoppel" prevented plaintiff's effort to avoid this limitation.<sup>153</sup>

The dissent argued that the majority erroneously refused to consider the claimed invention as a whole, thereby reducing the doctrine of equivalents to a redundant literal infringement analysis.<sup>154</sup> According to the dissent, considering the claim as a whole resulted in finding an infringement because the claimed invention stored the fruits' position using shift registers, while the accused device stored the same data with a combination of queues and pointers.<sup>155</sup> The dissent, therefore, considered the issue of file wrapper estoppel irrelevant because the accused device, considered as a whole, had the equivalent of the patent's disclosed position indicating means.<sup>156</sup>

*C. Pioneering Inventions and the Prior Art: The Use of Objective Criteria in the Doctrine of Equivalents*

The Federal Circuit's decision in *Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*<sup>157</sup> represents an important modification to *Pennwalt*'s mandated element-by-element analysis. In *Corning Glass*, the plaintiff alleged infringement of claims to an optical fiber having a core containing up to fifteen percent of an added chemical or "dopant."<sup>158</sup> The core was surrounded by a cladding layer of fused silica which optionally contained a dopant.<sup>159</sup> The dopant increased the refractive index of the core relative to the cladding layer and was therefore known as a positive dopant.<sup>160</sup> Using the positive dopant to increase the refractive index of the core drastically improved the distance that the fibers transmitted light, thereby allowing the first-ever use of the fibers in optical communications.<sup>161</sup>

At issue in the case was whether an optical fiber using a negative dopant in the cladding to decrease the refractive index of the cladding layer

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153. *Id.* at 938. File wrapper estoppel prevents the patentee from reclaiming, through the doctrine of equivalents, what was willfully surrendered before the Patent Office through a limiting argument or amendment to obtain the patent. *See, e.g.,* *Exhibit Supply Corp. v. Ace Patents Co.*, 315 U.S. 126, 136 (1942) (holding that an amendment to the claims to avoid a rejection based on the prior art limits the application of the doctrine of equivalents).

154. *Pennwalt*, 833 F.2d at 940 (Bennett, J., dissenting).

155. *Id.* at 944.

156. *Id.*

157. 868 F.2d 1251 (Fed. Cir. 1989).

158. *Id.* at 1255.

159. *Id.*

160. *Id.*

161. *Id.* at 1254.

relative to the core infringed upon the claimed optical fiber under the doctrine of equivalents.<sup>162</sup> The court first noted that disclosure of the claimed invention created enormous interest in the fiber optics industry, was the subject of many articles, and earned the inventors numerous awards and honors.<sup>163</sup> The fibers achieved worldwide commercial success by solving the problem of long distance light transmission that had frustrated researchers for over a decade.<sup>164</sup> These facts led the lower court to give the claimed invention pioneer status.<sup>165</sup> The court then explained that the element-by-element analysis under the doctrine of equivalents permits several claim limitations to be combined in a single element of the accused device.<sup>166</sup> Because the combination of a negative dopant in the cladding layer and no dopant in the core was equivalent to the claimed limitation that the core have a refractive index above that in the cladding layer, the accused device was held to infringe the claims under the doctrine of equivalents.<sup>167</sup>

*Wilson Sporting Goods Co. v. David Geoffrey & Associates*<sup>168</sup> illustrates another objective analysis the Federal Circuit has applied under the doctrine of equivalents. The case involved a golf ball patented by Wilson Sporting Goods, and having a certain geometric configuration of dimples on the surface of the ball that increased flight distance.<sup>169</sup> The dimples were arranged so that when six imaginary lines, referred to as "great circles," are drawn across the widest part of the ball through the midpoints of twenty imaginary icosahedral triangles, no dimples intersected the six great circles.<sup>170</sup> The result was a ball having six axes of symmetry instead of one.<sup>171</sup> Wilson sued for infringement, alleging that the defendant sold golf balls that also had dimples arranged in an icosahedral pattern with

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162. *Id.* at 1259.

163. *Id.* at 1255.

164. *Id.* at 1255-56.

165. *Id.* at 1255. A "pioneer invention" is entitled to a broader range of equivalents than nonpioneering inventions. *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 861 n.15 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1068 (1989). Aside from commercial success and impact on the industry, the courts also consider the relative sparseness of prior art relating to the invention and whether a claimed invention provides a function never before provided. See *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 846 F.2d 1369, 1370 (Fed. Cir. 1988) (denying rehearing en banc) (stating that the scope of the claims is determined in light of the patentee's disclosure, the prosecution history, and the prior art); *LaSalle v. Carlton's Laydown Serv., Inc.*, 680 F.2d 432, 435 (5th Cir. 1982) (noting that a pioneer patent performs a function never performed before).

166. *Corning Glass*, 868 F.2d at 1259 n.6.

167. *Id.* at 1260-61.

168. 904 F.2d 677 (Fed. Cir.), *cert. denied*, 498 U.S. 992 (1990).

169. *Id.* at 679.

170. *Id.*

171. *Id.*

six great circles. The great circles on the accused golf balls, however, were not dimple-free as the claims at issue literally required.<sup>172</sup> In the absence of literal infringement, the issue became whether there was infringement under the doctrine of equivalents.<sup>173</sup>

The evidence showed that the accused balls had sixty dimples that intersected the great circles by up to nine thousandths of an inch.<sup>174</sup> In its analysis under the doctrine of equivalents, the Federal Circuit applied the tripartite function-way-result test of *Graver Tank*.<sup>175</sup> However, the court conditioned application of the doctrine of equivalents on the caveat that the scope of equivalency of what is literally claimed cannot embrace the prior art at the time of patentee's invention.<sup>176</sup> Comparing the accused ball to the prior art, the court first created a hypothetical claim of sufficient breadth so that the accused ball would literally infringe the hypothetical claim.<sup>177</sup> Finding the hypothetical claim to permit dimple intersection of thirteen percent or less when stated as a percentage of dimple radius, the court compared the hypothetical claim to prior art golf balls having dimple intersections of seventeen to twenty-one percent.<sup>178</sup> The court further noted that the hypothetical claim would recite the presence of less than sixty intersecting dimples, while the prior art ball had thirty intersecting dimples.<sup>179</sup> Holding the difference between the prior art and the hypothetical claim to be so slight as to render the hypothetical claim as a whole obvious, the application of the doctrine of equivalents was held to be improper.<sup>180</sup>

Review of the doctrine of equivalents in infringement cases reveals courts' unwillingness to consistently require evidence beyond the function-way-result test in defining an equivalent. This reluctance is analogous to courts' refusal, before 1952, to define the standards controlling

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172. *Id.*

173. *Id.* at 683.

174. *Id.* at 685.

175. 339 U.S. 605, 608 (1950); see *supra* notes 111-21 and accompanying text (discussing *Graver Tank* and the function-way-result test).

176. *Wilson*, 904 F.2d at 683. The issue of whether the range of equivalents would cover what is already in the public domain is one of law, thereby allowing the Federal Circuit to apply a de novo standard of review. *Loctite Corp. v. Ultraseal, Ltd.*, 781 F.2d 861, 870 (Fed. Cir. 1985).

177. *Wilson*, 904 F.2d at 685.

178. *Id.*

179. *Id.*

180. *Id.* The Federal Circuit later noted that a hypothetical claim analysis is not required in every application of the doctrine of equivalents, but is merely a tool that helps define the limits imposed by the prior art on the range of equivalents. *Key Mfg. Group, Inc. v. Microdot, Inc.*, 925 F.2d 1444, 1449 (Fed. Cir. 1991).

what changes in the prior art deserved the grant of a patent.<sup>181</sup> Comparison of the standard of obviousness and the doctrine of equivalents shows that the two address similar problems having similar definitional difficulties.<sup>182</sup> This comparison shows that application of the doctrine of equivalents should be clarified by focusing on objective criteria in a manner similar to the analysis of obviousness developed subsequent to the Patent Act of 1952.

### III. NONOBVIOUSNESS AND THE DOCTRINE OF EQUIVALENTS: HOW SIMILAR ARE THEY?

#### A. *The Initial Question*

Analysis of the nonobviousness aspect of a claim's validity necessarily requires a comparison of the claim to an outside standard in the prior art.<sup>183</sup> Furthermore, application of the doctrine of equivalents requires a comparison of the claim to an outside standard—in this instance, the accused device.<sup>184</sup> For over a century, courts have wrestled with the problems of each analysis, stating in clear terms what distinctions between a claim and the prior art merit patentability<sup>185</sup> and what distinctions between a claim and an accused device are sufficiently insignificant to represent an equivalent.<sup>186</sup>

The analysis applied to answer questions of patentability first evolved through standards of "substitutions of equivalents,"<sup>187</sup> "invention,"<sup>188</sup> and "creative flashes of genius"<sup>189</sup> before the current standard of nonobviousness was definitively set forth. Throughout the period preceding the

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181. See *supra* note 61 (reviewing statements by the courts at the turn of the century on the perceived impossibility of defining invention).

182. See *infra* notes 183-201 and accompanying text.

183. See *supra* note 11 (stating the requirements found in 35 U.S.C. § 103 (1988)).

184. See *supra* notes 111-21 and accompanying text (explaining the function-way-result test of *Graver Tank*).

185. See generally *supra* notes 34-110 and accompanying text (tracing the historical development of nonobviousness).

186. See generally *supra* notes 111-80 and accompanying text (reviewing the various tests used in determining the range of equivalents for a claim).

187. *Smith v. Nichols*, 88 U.S. (21 Wall.) 112, 119 (1875) (holding that a new device that functions in the same way to achieve the same results as a device in the prior art does not merit patentability); see also *supra* note 47 and accompanying text (comparing the use of equivalents analysis to determine validity and infringement issues).

188. *Smith v. Goodyear Dental Vulcanite Co.*, 93 U.S. 486, 493-95 (1877) (holding that patentability rested on whether a device was found to represent a true invention); see also *supra* notes 52-59 and accompanying text (reciting the facts and holding of *Goodyear*).

189. See *Cuno Eng'g Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 91 (1941) (indicating that a device must result from a "flash of genius" to merit patentability); see also *supra* notes 70-71 and accompanying text (detailing the confusion in patent law resulting from *Cuno Engineering*).



Patent Act of 1952, courts reiterated the difficulty in outlining a definite test to be applied in all situations to all technologies.<sup>190</sup>

In contrast, the basic doctrine of equivalents analysis has deviated little in the last century from the test of whether the accused device performs substantially the same function in substantially the same way to achieve the same result (the function-way-result test).<sup>191</sup> Despite arguments that the current analytical framework creates uncertainty in patent law,<sup>192</sup> courts view the doctrine as equitable and not properly subject to unsparing logic at the expense of justice.<sup>193</sup> While several judges on the Federal Circuit recognize the uncertainty inherent in the doctrine and suggest limiting its application,<sup>194</sup> courts' reluctance to articulate a meaningful definitional limitation is reminiscent of the judicial reluctance to define the standard of invention prior to the Patent Act of 1952.<sup>195</sup>

The fact that the doctrine of equivalents is an equitable doctrine is not to say it is a doctrine without principled subsets of analysis. The doctrine

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190. See, e.g., *McClain v. Ortmyer*, 141 U.S. 419, 427 (1891) (stating that "whether the variation relied upon in a particular case is anything more than ordinary mechanical skill is a question which cannot be answered by applying the test of any general definition"); *Harries v. Air King Prods. Co.*, 183 F.2d 158, 162 (2d Cir. 1950) (noting that the concept of invention is "as fugitive, impalpable, wayward, and vague a phantom as exists in the paraphernalia of legal concepts").

191. *Compare Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950) (stating that infringement occurs where the accused device performs substantially the same function in substantially the same way to obtain the same result) *with* *Machine Co. v. Murphy*, 97 U.S. 120, 125 (1878) (stating that infringement occurs where the accused device performs substantially the same function in substantially the same way to obtain the same result).

192. See, e.g., DALE S. LAZAR, *INFRINGEMENT CONCEPTS* 114 (1992) (stating that the debate over balancing the public's right to notice of the invention and the inventor's right to secure protection of the patent remains unresolved); Adelman & Francione, *supra* note 8, at 728-29 (urging that the doctrine be buried except to the extent no other doctrine is available); Eshelman, *supra* note 125, at 909 (stating that the real issue is simply what constitutes an equivalent).

193. *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1563 (Fed. Cir. 1986) (stating that an inventor is entitled to a fair scope of claim language to prevent fraud on the patent).

194. See *Charles Greiner & Co. v. Mari-Med Mfg.*, 962 F.2d 1031, 1036 (Fed. Cir. 1992) (advocating "careful confinement" of the doctrine of equivalents to its equitable rule to promote certainty and clarity in patent law); *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991) (stating that application of the doctrine of equivalents should be the exception and not the rule).

195. *Compare Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1361 (Fed. Cir. 1983) (stating that the doctrine of equivalents cannot be a "prisoner of a formula") *with* *McClain v. Ortmyer*, 141 U.S. 419, 427 (1891) (stating that the issue of whether an invention is anything more than ordinary skill, and therefore patentable, "is a question which cannot be answered by applying the test of any general definition").

can be limited by file wrapper estoppel,<sup>196</sup> and at times is subject to a hypothetical claim analysis.<sup>197</sup> However, problems of uncertainty remain when a court chooses to distinguish between pioneering and nonpioneering inventions, but fails to identify to what extent the scope of the claims may be broadened in the case of a pioneering invention.<sup>198</sup> Uncertainty also arises when a court's equitable discretion must determine whether a series of claim elements will require an element-by-element analysis mitigating against infringement, or whether the same series of claim elements can be considered a single element in the search for an equivalent.<sup>199</sup> In relying on the equitable nature of the doctrine of equivalents and the selective application of various limitations, some well defined and others not, the Federal Circuit is essentially balancing the interests outlined by the *Graver Tank* majority and dissent.<sup>200</sup> Perhaps this is why application

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196. See *supra* note 153 (explaining that file wrapper estoppel prevents the patentee from recapturing exclusive rights to an embodiment that were willfully surrendered before the Patent Office).

197. See *supra* note 168-80 and accompanying text (reviewing the application and purposes of the hypothetical claim analysis).

198. See *supra* note 165 (listing criteria that may identify a pioneering invention).

199. See *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1259 (Fed. Cir. 1989) (holding that a series of claim limitations may correspond to a single element in the accused device); *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 949 n.1 (Fed. Cir. 1987) (Nies, J., additional views) (stating that one to one correspondence between claim elements and the accused device is not required when applying the doctrine of equivalents), *cert. denied*, 485 U.S. 961, and *cert. denied*, 485 U.S. 1009 (1988).

200. 339 U.S. 605 (1950). Not that such a balancing test has been especially instructive. See *Smith, supra* note 26, at 914; *Wegner supra* note 26, at 4. Despite the Federal Circuit's affirmations of the equitable nature of the doctrine, courts seldom relate the particular facts of a case to the opposing interests of this balancing test. See, e.g., *Valmont Indus. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1044-45 (Fed. Cir. 1993) (reversing district court's finding of infringement under the doctrine of equivalents while referring to the "unscrupulous copyist," but not discussing the presence or absence of evidence showing whether willful copying occurred); *Sun Studs, Inc. v. ATA Equip. Leasing, Inc.*, 872 F.2d 978, 989-90 (Fed. Cir. 1989) (balancing fraud on patent against the public's right of reliance on the claim language, and holding that the jury could have reasonably found infringement by the function-way-result test where the record contained no evidence of fraud or copying by defendant).

Despite continuous references to fraud and copying, no relationship exists between the "unscrupulous copyist" and willful infringement under 35 U.S.C. § 284 (1988). See *Slimfold Mfg. Co. v. Kinkead Indus.*, 932 F.2d 1453, 1457-59 (Fed. Cir. 1991) (reversing the district court's finding of infringement under the doctrine of equivalents and remanding the issue of enhanced damages for willful infringement because the previous finding regarding equivalents "certainly" influenced the trial court's findings on willful infringement); *Yarway Corp. v. Eur-Control USA, Inc.*, 775 F.2d 268, 275, 277-78 (Fed. Cir. 1985) (finding infringement where defendant's former employee testified that he had knowledge of the patent and made minimal changes to avoid infringement while maintaining the same function, but reversing the district court's enhancement of damages for willful infringement because designing around a patent to avoid infringement is a benefit to the patent system).

of the same tripartite test to issues of validity<sup>201</sup> was rejected by the courts and by the Patent Act of 1952.

### B. *The Current Focus of Each Analysis*

Using section 103 of the Patent Act of 1952 as its analytical basis, the Supreme Court formulated a principled approach to validity issues focusing on factual considerations such as (i) the scope of the prior art, (ii) a determination of the differences between the prior art and the claim, and (iii) an ascertainment of the level of skill of one of ordinary skill in the art.<sup>202</sup> The Federal Circuit, when assessing the issue of nonobviousness, has further utilized objective criteria in requiring a motivational teaching or suggestion to modify the prior art and consideration of objective criteria in the analysis.<sup>203</sup> Thus, the focus of this analysis centers on the hypothetical person having ordinary skill in the art, and what the prior art would have suggested to that person.<sup>204</sup> It is an attempt to quantify this person's knowledge and skill to the extent possible, thereby rewarding innovation surpassing the ordinary level of knowledge and skill through a patent grant.<sup>205</sup> As Congress made clear, the claimed invention must be considered as a whole without exception in the comparison of the claim and the prior art.<sup>206</sup>

In contrast, the current analysis under the doctrine of equivalents is (i) a determination of the scope of the claims at issue, (ii) an ascertainment of the differences between the claim and the accused infringing device, and (iii) application of the tripartite function-way-result test set forth in *Graver Tank*.<sup>207</sup> The function-way-result test compares the claim to the accused device itself, not the hypothetical person's knowledge or skill.<sup>208</sup> However, the divergence of analysis between nonobviousness and the doctrine of equivalents in considering claims on an element-by-element basis or as a whole, is less reasoned. Section 103 requires consideration of the claims and the invention as a whole in all cases.<sup>209</sup> Conversely, the

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201. See *supra* notes 46-48 and accompanying text (discussing the Supreme Court's reference to the function-way-result test in determining the validity of a patent in *Smith v. Nichols*, 88 U.S. (21 Wall.) 112 (1875)).

202. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

203. *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572 (Fed. Cir. 1984); see *supra* note 107 (discussing the Federal Circuit's emphasis on secondary considerations of obviousness).

204. See *supra* notes 84-107 and accompanying text.

205. See Rich, *supra* note 72, at 399, 406.

206. 35 U.S.C. § 103 (1988).

207. 339 U.S. 605 (1950).

208. See *supra* note 112 and accompanying text.

209. 35 U.S.C. § 103 (1984).

current state of analysis under the doctrine of equivalents mandates an element-by-element comparison of the claim and the accused device, focusing only on their differences in the search for an equivalent.<sup>210</sup> This rule is softened by the willingness of the Federal Circuit to consider a claim “‘element’” to embrace a single limitation or a series of limitations.<sup>211</sup>

Furthermore, statements by the Federal Circuit that the “as a whole” rule articulated in *Hughes Aircraft* has not been overruled also cast doubt on the certainty of the element-by-element comparison.<sup>212</sup> The net result is that the Federal Circuit may at times refuse to find infringement under the doctrine because a single claimed element has no direct equivalent in the accused device.<sup>213</sup> In other instances, however, it will consider the equivalent for a series of claim limitations to be present in a single component of the accused device.<sup>214</sup> This is a marked departure from section 103 analysis, which requires consideration of the claim as a whole at all times.<sup>215</sup> The doctrine of equivalents also allows for the application of secondary tests, such as whether the invention represents a pioneering invention,<sup>216</sup> or whether a hypothetical claim of expanded scope might have been patentable over the prior art.<sup>217</sup> These secondary tests force discussion of objective facts and may be viewed as equitable in nature. However, their application is selective,<sup>218</sup> doing little to illuminate a consistent approach to meeting the goals of preventing fraud on the patent and using the claim language to provide fair notice to the public.<sup>219</sup> Indeed, courts rarely consider a focus on the *mens rea* of the accused infringer.<sup>220</sup> This balancing, in the absence of evidence of copying by the

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210. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931 (Fed. Cir. 1987) (en banc), cert. denied, 485 U.S. 961, and cert. denied, 485 U.S. 1009 (1988). See generally *supra* notes 142-53 and accompanying text.

211. *Corning Glass v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1259 (Fed. Cir. 1989).

212. *Id.*; *Pennwalt*, 833 F.2d at 949 (Nies, J., additional views).

213. *Pennwalt*, 833 F.2d at 939.

214. See *Sun Studs, Inc. v. ATA Equip. Leasing, Inc.*, 872 F.2d 978, 989 (Fed. Cir. 1989); *Corning Glass*, 868 F.2d 1251, 1259.

215. Rich, *supra* note 72, at 405-06.

216. See *supra* notes 157-67 and accompanying text.

217. See *supra* notes 168-80 and accompanying text.

218. *Key Mfg. Group, Inc. v. Microdot, Inc.*, 925 F.2d 1444, 1449 (Fed. Cir. 1991) (stating that the hypothetical claim analysis is not required in every application of the doctrine of equivalents).

219. See *Graver Tank & Mfg. Co. V. Linde Air Prods. Co.*, 339 U.S. 605, 607 (1950).

220. See *supra* note 200 (exemplifying the Federal Circuit's repeated references to the unscrupulous copyist in the absence of evidence proving or disproving the presence of such a fraud). Where courts, using an equity balancing approach, do not use a factual inquiry in determining whether “copying” has taken place, the result is likely derived from a judge's

defendant, results in an ad hoc approach to cases where the outcome of the *Graver Tank* test is often rationalized by conclusory statements that the accused device does or does not operate "in substantially the same way" as required by the test.<sup>221</sup>

*C. A Proposal to Identify a Consistent Policy Regarding Equivalents and a Test to Further that Policy*

The Patent Act of 1952 provided the basis for an ordered analysis to be applied uniformly with the expectation that the courts would provide additional criteria as time progressed.<sup>222</sup> Despite section 103's shortcomings,<sup>223</sup> it directly speaks to the policy of denying patentability to insubstantial changes in the prior art,<sup>224</sup> and is a significant improvement

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individualized notions of which interest is generally more important, an inventor's interest in gaining extended protection for an invention, or the public's right to fair notice as to what technology may be freely used without the threat of a lawsuit alleging patent infringement. See *Malta v. Schulmerich Carillons, Inc.*, 959 F.2d 923, 923 (Fed. Cir. 1992) (Newman, J., dissenting) (stating that the current interpretation of the doctrine of equivalents will continue to depend on the selection of the panel), *denying reh'g en banc to Malta v. Schulmerich Carillons, Inc.*, 952 F.2d 1320, 1327 (Fed. Cir. 1991) (holding that where patentee failed to explain *why* the function, way, and result of accused device was the same as that claimed, infringement under the doctrine of equivalents could not be found); see also 1 PATRICK G. BURNS ET AL., "DESIGNING AROUND" VALID U.S. PATENTS 3-29 to 3-31 (1993) (asserting that the outcome of a close case under the doctrine of equivalents may depend on which panel of the Federal Circuit is hearing the case).

221. *Slimfold Mfg. v. Kinkead Indus.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991) (emphasis deleted) (recognizing that the critical issue when applying the function-way-result test most often turns on whether the devices work in the same "way" and that the function and results of a device are easier to ascertain); see also *Charles Greiner & Co. v. Mari-Med Mfg.*, 962 F.2d 1031, 1036 (Fed. Cir. 1992) (holding that an accused cervical collar having rigid support that extended beyond the front and rear portions instead of only at these portions, as claimed, achieved "better result[s] in a different way"). The issue is further complicated by the Federal Circuit's recognition that designing around patents promotes progress and is therefore desirable conduct to be encouraged. *Slimfold*, 932 F.2d at 1457. On the other hand, "fraud" is synonymous with dishonesty and bad faith. BLACK'S LAW DICTIONARY 660 (6th ed. 1990). Thus, it is difficult to see how one seeking to design around a patent can, consistent with the goals of the patent system, be accused of "fraud" or "bad faith."

222. See generally *supra* notes 84-107 and accompanying text (reviewing trends in the standard of nonobviousness since the passage of the Patent Act of 1952).

223. See Martin J. Adelman, *The New World of Patents Created by the Court of Appeals for the Federal Circuit*, 20 U. MICH. J.L. REF. 979, 991 (1987) (stating that the Federal Circuit's holdings on nonobviousness have been unpredictable, supported by no articulation of policy); Chris P. Konkol, *A Critique of the Concept of Relative Significance in Determining Obviousness*, 31 IDEA: J. LAW & TECH. 223, 263 (1991) (discussing the problem of considering how much weight to give to unexpected results when determining nonobviousness).

224. See *Graham v. John Deere Co.*, 383 U.S. 1, 7-9 (1966) (quoting Thomas Jefferson, the first administrator of the United States patent system, as recognizing the need to have "a line between the things which are worth to the public the embarrassment of an exclu-

over previous wide ranging and subjective analyses of what constituted true invention.<sup>225</sup> The relative uncertainty still surrounding the doctrine of equivalents, however, is likely due to the selective focus on objective facts such as the relevant prior art and the pioneering nature of the claimed invention.<sup>226</sup>

The challenge of consistent and predictable application of the doctrine of equivalents requires identification of the interests sought to be served by the patent system and the doctrine,<sup>227</sup> development of a theory as to how those interests are best achieved,<sup>228</sup> and articulation of objective standards with sufficient clarity to achieve the stated interests.<sup>229</sup> One possibility entails increased emphasis on objective considerations, such as the teachings of the prior art and the determination of when an invention is a pioneering invention.<sup>230</sup> This approach must be coupled with a clear statement as to whether a pioneer invention is entitled to exclude others from practicing all improvements that flow from that invention.<sup>231</sup> Clar-

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sive patent, and those which are not"); *supra* notes 31-32 (identifying the policies driving the first patent statutes in the United States).

225. Rich, *supra* note 72, at 404.

226. See generally *supra* notes 157-80 and accompanying text.

227. Aside from the often repeated interests of the public's right as to the scope of the patent grant provided by the claim language, the elimination of fraud, and avoiding slavish conformity to the claim language, the broader question turns on a policy decision regarding an inventor's proper scope of protection. See Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 840, 852-68, 877 (1990) (reviewing the tensions in the current infringement analysis and concluding that the proper patent scope should promote competition in research instead of unified control).

228. For an explanation of reward theory, prospect theory, and rent dissipation, see Mark F. Grady & Jay I. Alexander, *Patent Law and Rent Dissipation*, 78 VA. L. REV. 305, 310-21 (1992) (proposing rent dissipation as an accurate model for assessing the goals of the patent system).

229. A detailed economic analysis of the proper scope of patent coverage is a necessity in articulating a policy and a rule. Because this Comment does not provide such an analysis of the economic theories, no position is taken on the proper scope of patent claims.

230. See *supra* note 165 (listing objective criteria in identifying a pioneering invention as the relative sparseness of prior art relating to the invention, and whether a claimed invention provides a function never before provided).

231. The Federal Circuit has repeatedly stated that an improvement of a patent does not necessarily escape infringement under the doctrine of equivalents. See, e.g., *Hughes Aircraft Co. v. United States*, 717 F.2d 1351 (Fed. Cir. 1983) (holding that use of an on-board computer that was not developed at the time the invention was patented was an improvement that did not escape the doctrine of equivalents). However, the court may escape this broad statement of policy by finding that the improvement is so substantial that the accused device does not operate in the same way as that claimed. See *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1571 (Fed. Cir. 1986) (stating that the accused device did not infringe a pioneering patent to a hand-held calculator because the technological changes in the accused device were too great). The policy could also be avoided by a strict application of a rigid element by element analysis. See *supra* notes 210-14 and accompanying text (noting the ability of the courts to justify a

ity in the law may also be provided by expanding the scope of a claim only when objective criteria identifying a pioneering invention are present, just as the identification and discussion of objective criteria are necessary to support a holding of obviousness.<sup>232</sup> Increased focus on objective considerations rather than sole reliance on the tripartite test of *Graver Tank* will increase predictability, decrease predatory litigation, and stimulate judicial opinions relating objective facts to the equivalents definition.

### III. CONCLUSION

Issues under the obviousness of inventions and the doctrine of equivalents are controlled by a similar analysis, a comparison of the claim to an outside standard, whether the outside standard is prior art or an accused infringing device. Each analysis is ultimately answered by a definition of what difference between the claim and the outside standard is sufficient to defeat patentability or a finding of infringement. The current obviousness analysis based on objective criteria provides judicial opinions properly based on relevant facts. The doctrine of equivalents should likewise consistently require analysis of objective facts such as the prior art and the pioneering nature of the claimed invention to avoid the uncertainty presently surrounding its application.

*Stephen G. Kalinchak*

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holding of either infringement or noninfringement by characterization of either a single claim limitation or a group of limitations as an element).

232. See *supra* notes 84-87 (discussing the three part inquiry of *Graham v. John Deere Co.*, 383 U.S. 1 (1966)).